CS29003 ALGORITHMS LABORATORY
(WorkSheet 2-Solutions)
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1 The time complexity and the divide and conquer algorithm

1.1 Question 1 - The time complexity

Basically the problem is actually maximum sub array problem . Using Divide and Conquer approach, we can find the maximum sub array sum in O(nLogn) time.

1.2 Question 1 - The divide and conquer algorithm

1) Divide the given array in two halves .
2) Return the maximum of following three .
    a) Maximum sub array sum in left half (Make a recursive call).
    b) Maximum sub array sum in right half (Make a recursive call).
    c) Maximum sub array sum such that the sub array crosses the midpoint.

The lines 2.a and 2.b are simple recursive calls. now to find maximum sub array sum such that the sub array crosses the midpoint i.e for 2.c , we can easily find the crossing sum in linear time. The idea is simple, find the maximum sum starting from mid point and ending at some point on left of mid, then find the maximum sum starting from mid + 1 and ending with sum point on right of mid + 1. Finally, combine the two and return.